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An Essay
On Yellow Fever
by
John Adams
of
Pennsylvania

Introductory Remarks

We owe to the Study of History & especially to that of Medicine the Knowledge of several extraordinary Diseases which by turns and at divers intervals have overrun the globe & afflicted the human Species: different in their principles, they ought to have, & have had different effects; some owing to local & accidental circumstances have had but a transitory existence & have disappeared with the causes that gave birth to them: others produced by a defect which if the expression may be allowed is identified with our being, have exercised a more profound, durable & fatal influence over the Animal economy; it is to the healing art that we owe the attenuation of some & the cessation of others; but if its efforts are always useful & often successful in combating a Disease, when it has manifested

itself, they are impotent & of no effect against the force of Nature, which changes, modifies, preserves & destroys according to our conformity to her. Continual reaction observed by ~~antiquity~~ the ancients who made a religious dogma of it, personified by the supposed wrestle of the good & bad principle which is the Allegory of it; a reaction whose effects may be easily moderated, but to determine whose laws & to destroy the cause is impossible; Conquered under one form she appears under another, subdued in one place, it diffuses itself in another; no disease not even the plague has sacrificed so many victims & none inspires such just dread, none ~~[illegible]~~ demands more the indefatigable zeal & attention of the Physician: none demands with more force and justice the vigilance & attention of Magistrates.

The Knowledge of the Nature of this scourge is a problem so important to solve, acquires by reason of its proximity, an interest which is becoming daily

more pressing; I do not pretend to dispel all the doubts with respect to it, but propose to offer with due circumspection, a few reflections that may throw some light on the subject as obscure as it is important: I hope that in reading them, it will be readily perceived that my only aim has been the desire & hope of being useful

General Characters

The Yellow Fever presents some principal features, essential phenomena, inseparable & distinct from this Disease, that the difference of Places may attenuate but can never entirely destroy—

1st. It is not capable of developing itself but in a certain determinate temperature

2nd. It is circumscribed particularly in the temperate Zones & in the bosom of large Cities

3rd. It does not attack Persons who have once had it, provided they do not remove to a Northern climate & then again return to the Islands. — These three characters with the exception of some slight modifications applicable to the climates of the Torrid Zone, as well as to those of the Temperate, make the Yellow Fever a Disease of itself

Symptoms of the Yellow Fever.

Although the Yellow Fever runs it course

in a short time, it is nevertheless essential to distinguish in its march two periods marked by symptoms peculiar to each of them. In the First period we observe at the commencement a general & common affection of the physical & intellectual faculties by which the vis motrix and the spirits are suddenly prostrated; terror is depicted in the countenance, this is particularly manifested by deep & distressing sighs; most persons complain of a sensation rather uneasy than painful, in the region of the stomach, this they generally flatter themselves can be relieved by vomiting. — Although the colour of the skin & particularly that of the face is sometimes red & fiery, the pulse is scarcely more frequent than usual; drowsiness never fails to succeed it.

The pulse has been known to beat, but forty pulsations in a minute — This phenomenon generally makes its appearance about the third or fourth

day. It even appears that the arterial vibration by its want of elasticity, foreboded the approaching decomposition of the constitutive principles of the blood; one would be induced to believe that it was not a liquid, but wind that circulated in the arteries. — dull & sharp pains at intervals are felt in the Loins, Knees, Sockets of the eyes, & in the nape of the neck, & although they force at times the Patient to cry out, they do not revive him from the species of Comatose affection into which he is often plunged; when he is spoken to, he replies with difficulty; his eyes wander & he appears distressed; the light is unpleasant to him; the vessels of the Conjunctiva are engorged, the gums become dry; if you attempt to open his mouth his under-lip trembles & with difficulty he can put out his tongue, which is generally found incrusted with a tenacious slime.

bordering on a yellow colour, & although it is dry the Patient is not thirsty, and if you attempt to force him to drink, you cause him considerable uneasiness and often provoke him to vomit. — Second Period. In proportion as the Disease progresses, the symptoms become aggravated & the second period commences. — Soon Hemorhage from the Nose takes place, stripes of a yellowish colour are observed towards the passage of the Carotid & Temporal arteries, the manifest & extraordinary pulsations of which denote their extreme dilatation; vomiting takes place, the liquid and matter thrown up from the Stomach acquire gradually a deeper colour — The oesophagus and Thorax are painfully affected with the sharp and caustick tastes which accompany them, & immediately after, are seen Blackish-flakes resembling Coffee-grounds floating in the middle of the slimy water — The yellowness

increases rapidly; the suppuration of a Blister (if one has been applied) changes also in nature and colour; the Urine ceases to flow, livid-spots appear on the surface of the body — a petechial eruption, sometimes pale & ash coloured, but oftener red & violet, makes its appearance on the Neck & Chest; the dejections become black & bloody, in short, there flows from all the excretory emunctories a dissolved & foetid blood, and the Patient generally sinks under the Disease about the fourth or seventh day; such are the symptoms that the yellow fever presents. — It is scarcely necessary to observe that difference of Constitution, peculiar circumstances depending on places, Weather & Seasons may present some alterations and give place to symptoms out of the common rule. — In some individuals the signs of irritation & of plethora have been known to be protracted untill the

seventh day, this observation has been made particularly at the commencement or termination of the Epidemick — Similar to all the other derangements of the animal economy, the Yellow-Fever has symptoms which are common to it with other Diseases, and others which are peculiar to itself. — Those which appear exclusively to belong to it, are, the return of the pulse to its natural state about the third, or fourth day, the black-vomit, & the spontaneous and total suppression of the Urine; these three symptoms which indicate the most violent degree of the Disease are so much the more formidable & fatal as they become concentrated

The name of Yellow-Fever under which it is known, has the disadvantage of presenting to the mind but one of its phenomenon & teaches us nothing respecting the nature & seat of the Disease. — The name of Fever essentially

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nervous & malignant, appears to me so much the more proper, to give an exact idea of it, & it is generally agreed to thus call all Fevers of a dangerous character. — If this qualification is truly that which best accords with them, it is particularly to the Yellow Fever, as an essential Disease of the Nervous System, that it is peculiarly applicable; indeed it is difficult to account for this variety of symptoms the congregation of which seems impossible, without supposing a general & extraordinary alteration of the vital principal; how otherwise to account for the simultaneous appearance of so many frightful symptoms that are met with in this Disease, the result of which is always the decomposition of the Animal economy. — The Vomiting, Hemmorhage, the Yellowness & the suppression of the Urine, are but the effects of them. — It is not because the stomach contains

a bilious slimy mucous, that it rejects every thing that is taken in to it; it is not owing to a too great quantity of blood, & its affluence to the head that we must attribute the hemorhage; it is not to the overflowing of the Bile that we should impute the yellowness of the skin; it is not in fine, to a local defect of the urinary passages that we can explain the suppression of the urine; all these symptoms should be considered as an inevitable consequence of the defect of action of the vital principle, of the derangement of the equilibrium between the Nervous & the other systems. — Were I to be asked how this derangement operates & it were exacted of me to determine the essential character, the principal cause of the destruction of the equilibrium, it would be necessary to enter into theoretical details, susceptible of much controversy, without perhaps throwing any light whatever

on the Disease itself. For, whoever has had an opportunity of observing this Disease, its nature &c admitted & rejected by reasons for and against, supported & combatted by systematic opinions, might furnish matter for much erudition. It appears to me not difficult to conceive a cause which acts on the Nervous system without carrying its action on the other systems, untill the vital principle severely wounded, can no longer direct the functions of the other organs. From that time the animal economy falls into a Confusion so much the more Anarchical, as the impellent principle is wounded, & the causes which derange it, are numerous & powerful.—

Results of Post-Mortem-Examinations

The opening of bodies comes to the support of this reasoning; their inspection demonstrates that

it is not such and such a function that is deranged, such or such a humour vitiated in preference to another, but the whole of the Animal-economy that is attacked & the entire mass of the humours corrupted. — It is to this principal cause that we must impute the variations that are observed in the march & in the effects of this Disease; variations which are evidently the result of the more or less intimate connection, which on account of the peculiar Constitution of each individual, exists between the Nervous System, and the other Organs — The Stomach & intestinal canal in some, indeed, are distended & turgid by an inflammable & fœtid gas; their membranes especially the internal one, strewed with livid and gangrenous specks; in others the Liver & Spleen are considerably more voluminous than usual; the Vesicle of the Gall-Bladder and the other biliary canals sometimes obstructed by

Black Bile which is thick & viscous, sometimes containing a small quantity of a a green & extremely fluid liquor. — On inspection of the Bladder, it is always found empty when there is a suppression of Urine; & also that of the Kidneys which alone appear to be a little decayed; all these do not explain the phenomenon. — In the Chest especially when this Cavity has been particularly attacked, enchymosis of the Pleura, of the Mediastinum, and sometimes black spots on the Lungs; an incision made into this viscus, a brown & sanious humour flows out instead of a red & frothy blood; the Pericardium is filled with a nauseous serosity & acquires sometimes a prodigious size; the ventricles of the heart and the arterial vessels are more relaxed and less elastick, their texture is softer and more flabby and gives way at the slightest touch; this important organ appears to be in a state

of Maceration; In the Brain the sinuses contain a deeper coloured blood than usual, there are sometimes found bloody effusions under its envelopes; in fine, the whole mucous tissue is saturated with a yellow serosity, similar to that which runs from the surrounding parts of a scarified Carbuncle; all these symptoms are not common & are not ordinarily met with concentrated, but in few cases. In some I repeat it, it is the Abdomen that is affected, in others the Chest or Head, however these circumstances are not to be considered as certain; and if it was an affection that should be thought general, it would be the inflammation of the stomach, in consequence of the frequent vomiting to which the principal number of Patients, are subject; however this symptom has sometimes failed; I have known patients to die who had had hemorrhage, yellowness

suppression of Urine & so great an oppression as to be suffocated without having experienced any nausea, or inclination to vomit & whose stomachs were in their natural state.

In reflecting on the phenomena that the Yellow Fever presents, it is astonishing what an analogy is discovered between it & the Scurvy; all the difference (and doubtless it is considerable) consists in the one arriving to a crisis in seven & even in four days, whilst the other requires four & sometimes seven months

Causes of Yellow Fever

After having described the symptoms that furnish us with a knowledge of yellow Fever, we must analyze the causes which produce it. This research is so much the more important, as it interests both Medicine, & the Administration; the former in pointing out the

most efficacious means to combat it, & the latter to devise and establish such regulations as will tend to prevent its introduction. Before proceeding farther it will be well to recollect two propositions admitted in Natural Philosophy and demonstrated to be true by experience & observation. The first is, that a too powerful heat protracted for a length of time, affects, changes & modifies the Constitution of a Person not accustomed to it: the second is, that the air may be so altered and vitiated, as to cause not only dangerous diseases but also the most sudden death; let us prove by some examples the truth of these two propositions. Experience has taught us that in climates where the Thermometer of Fahrenheit rises to 80° in the shade & continues at this height for some time, the animal economy becomes more or less deranged. I make for the moment, abstraction of the other causes which may augment or attenuate this derange-

ment; I consider here but the effects of the Heat whatever may be the places or the time they are experienced, their influence is incurable. We know by the accounts of Travellers, that under the Torrid Zone where it is constantly at this degree, an European who resides there for a short time is exposed to dangerous diseases; such is inevitably the fate that attends him in the West Indies, at Batavia, Cayenne, or the Eastern & Southern Coasts of Africa &c &c

It appears absolutely necessary for a Person to live under that Latitude (provided he is not born there) must purchase that privilege by a modification of his system. It is scarcely necessary to observe that the effect being always in proportion to the cause, in Countries where the heat is penetrating and permanent, as in the Molluccas & at Payanna, the Diseases which result from an indispensable modification of the system, are of a more dangerous nature, and take place at all seasons of the

year. In climates a little more elevated, although situated under the Torrid Zone, they are more or less fatal according to the Place inhabited, and the season of the year when he is attacked; thus by a necessary Consequence these Diseases should not make their appearance in the Temperate Zones untill the Sun has arrived at his highest point of elevation & there diffuses his fires, as under the Torrid Zone. Produced by the almost continual presence of this Planet, they should cease at its decrease; in fact they do in the United States, & also in Spain.

In the United States the yellow fever is always known to succeed uncommon hot weather & to cease generally as soon as the first frosts appeare. It is well known that although New York & Philadelphia are situated under the Temperate Zone and are subject during winter to extreme cold weather, (even more severe than is experience in Europe under the same Latitude, greater heat

is felt there than in the West Indies — Some years ago, Fahrenheit's Thermometer stood at 90°. this was however but of short duration; the heat although excessive in the United States, is not of such long continuance as in the Islands — The change of the Seasons, the force & violence of the winds, the sudden variations of the Atmosphere are so many natural & powerful means to counter balance the effects of it; further I do not believe that the Yellow Fever in the Temperate Zones, is the result of heat alone, however powerful its action may be there; I repeat it, it has not in those climates the same duration, nor does it acquire there the same activity as it does in the Torrid Zones; it ought to be considered solely as a general & predisposing cause, without which the others could not develope themselves, but which united & combined with a multitude of local causes constitute the terrible pestilence which so often

has made such tremendous havoc in several of the large Sea Port Towns in the United States.— I do not believe that the Yellow Fever is a sporadic Disease susceptible of being transported from one place to another, on the contrary I believe that we should regard it as essentially attached to the places where it developes itself: from this I conclude that those Countries which do not contain the causes capable of developing it, have not commonly any thing to fear from their vicinage; but in places where every thing concurs to give it a powerful energy, it is impossible to be mistaken in its Epidemic-Contagious-character; this appellation does not accord with the Yellow-Fever, if to obtain it, the presence of a material virus, palpable & Communicable alone by the touch, is necessary: But if forced to admit in this class, a rare & extraordinary disease which has a focus (although circumscribed in

its limits from whence it diffuses itself, powerful causes which nourish it, a prodigious energy which affects all persons living in the circle of its activity and that it is impossible to avoid it otherwise than by flight, we cannot forbear giving it to the Yellow Fever, whatever may be elsewhere the vehicle & the means which serve to propagate it. I should remark here that the Epidemick Contagious nature of the Yellow Fever of the Temperate Zones, is a quality that is not found, especially in the same degree, in the Yellow Fever of the Torrid Zone. The reason of this phenomenon is owing I believe to the Atmospherick air, which should be regarded as the principal agent of its communication & which being less vitiated in the Islands, by the absence of the local causes which alter its principles on the Continent, constitutes this difference which exists not only for those who are acclimated, but also for those who are not acclimated — I will not attempt

to support the idea that this difference is invariable because if the principal character of a Disease may be easily determined by observation, it is not the same case with the various grades in different Places & at different times of the year, when they are the particular result of a multitude of causes and circumstances whose combination might vary ad infinitum: however there are more marked traits in one Country than another, of this number is the Epidemick Contagious Character, (I will not say exclusive) but inherent in the Yellow Fever of the United States; in fact, although on the Continent of America it seldom or never continues beyond three Months after Dog Days, the number of Persons who die of it, is much greater than in the Islands where it continues with more or less violence the whole year; in the United States its appearance is the Signal for the cessation of all other Diseases, in the Islands, it excludes none: two Hours of

residence in an affected City in the United States is sufficient to take the disease, in the Islands there are no well authenticated accounts of so rapid a communication taking place there — In the United States the Fever falls principally on the Inhabitants of Cities, or those who are born there, whereas, in the Islands, the Creole & acclimated Persons have always been exempt from it; we must I think infer from this, that in the temperate Zones it owes its principal existence to local and accidental causes which give it the Epidemick — Contagious — Character, a Character absolutely necessary for its developement, depending entirely on localities & peculiar circumstances which determine it, & to which we must particularly attribute the rapidity with which it is propagated and the great number of Persons who have fallen victims to it — In the Islands the Yellow — Fever has never been considered a disease susceptible of

being propagated by proximity or Contact.— During the American Revolution more than Three Thousand Patients were distributed in the different Hospitals at Cape-Francois, the Yellow Fever appeared more or less in all, without acquiring in any the Contagious Character; by the side of a person dying of this Disease was seen another afflicted with Dysentery or Diarrhoea, without Same having the least effect whatever upon the latter; this is a circumstance I have frequently witnessed in the Hospitals at Havanna and in several of the Windward Islands— although I persist in believing that the Causes of which I have already spoken are sufficient for the developement of the Yellow Fever, & that it is useless to recur to the system of importation, yet I will not deny that a Vessel whose Crew is attacked by this Disease, the air from the hold of which is vitiated by the fermentation of the

articles that compose the Cargo, arriving in a City subject to this Calamity, at a season of the year the most favourable for its developement, may be a means of propagating it; undoubtedly in this as in all other Diseases, the effect becomes cause in its turn.—

Diagnosis & Prognosis

The impotency of the healing art was never, unfortunately, more evident than in this Disease I do not believe that it is owing to its nature not being understood, but to the violence of the disease that we must attribute the inefficiency of the aids that Medicine furnishes — It is not for want of boldness that Physicians have not succeeded in arresting its devastations — The Disciples of the doctrines of Stahl, Cullen & Brown have not been more fortunate than those who adopted the doctrines of Boerhaave, Van Swieten & Stoll

Every practitioner who has treated Patients labouring under the Yellow Fever, has cured some and lost a great number: and if from the inutility of so many efforts, a single truth should be elicited, it would be that of the acknowledged inefficacy of all the Theories against a Disease which presents so many shades of difference. I will not attempt to point out an exclusive remedy, a treatment applicable to all cases, the Disease forbids it, but I will mention what Remedies I have seen administered & what I think should be done; the Disease is some years more fatal than others; I have witnessed & studied the influence of the Local & accidental causes on the human Constitution; this study recommended by the Father of Medicine in one of his immortal works is certainly of the greatest importance. If in all Countries it Constitutes an essential part of the healing art, it is particularly so in the United States, where

every thing is so different from what it is in Europe; it is of Consequence then to the progress of this art, to the reputation & glory of the Physician to pay strict attention to the Changes of the Atmosphere; to Compare the degrees of heat of one year with another, to observe the quantity of rain, the force & variation of the Winds, the quality of the soil we inhabit & the nature of the places surrounding it, to reflect in fact, on the influence all these agents have on the animal economy. — The Fever of the Islands is more or less fatal according to the situation of the places persons inhabit, the season of the year when he is attacked, the occupation he follows, & particularly the state of the mind — In the Epidemicks which I have witnessed in the Islands as well as those in the United States, I have always observed some degrees of difference between them, which without entirely changing the Character of the Disease

required nevertheless a modification in the treatment. The predominant symptoms of the Yellow Fever in the Islands are generally hemorrhages from the Nose, livid spots on the skin followed by cold clammy sweats, hiccough, & death, the yellowness of the skin is inconsiderable the black vomit occurs but in a few instances and the suppression of the Urine is a very rare circumstance. In the year 1794 the Yellow Fever made its appearance in St. Domingo in a most malignant form, attacking principally the British Troops who had made themselves masters of part of the Island. a general yellowness over the whole body & hemorrhages were the prevailing symptoms, both made their appearance about the 4th. or 7th. day, & were considered bad omens; the pulse at the commencement of the Disease was frequent; the skin preserved its colour, there was observed about the third day or feeling

the pulse, a kind of gaseous dilatation of which I have already spoken. — one or two moderate bleedings according to the Constitution of the Patient were considered serviceable; some good effects were obtained from the vegetable & mineral acids, also from mild vomiting, but nothing offered greater advantages than Bark given in large doses according to circumstances, rendered laxative by Cream of Tartar, or one of the Neutral Salts, a more tonic & active by Sal Ammoniac; Wine & Virginia Snake root combined; this treatment did not succeed so well at Port au Prince, where the intermittent type was scarcely perceptible, doubtless on account of it's less favourable situation; there were but few cases at Mirebalais, a Parish situated on very elevated Table Land, where the air is pure & the heat moderate, circumstances which prove that this Disease loses its strength and malignity in proportion as the places are

more a less elevated & cool that persons inhabit.

Some observations on the Treatment. In the year 1798 Cape Francois was severely visited by the Yellow Fever, from forty to fifty persons died daily, those who survived an attack of it were for a long time troubled with obstructions of the abdominal viscera & had a long & painful convalescence. This epidemic differed from that which was experienced at the same time at Port Dauphin by the duration of the Disease which was prolonged until the eleventh or fourteenth day & sometimes even until the twentieth, by a more frequent & strong pulse & by the marked & sensible intermittent character at the commencement of the Disease, obscure & almost effaced in its condition, but with attention, the traces of it could be readily recognised; often this character was not perceptible at the pulse, but it could be distinguished by the constant return

of some symptom such as Coma, vomiting, hiccough or a more considerable uneasiness & agitation; Tepid Baths, diluent drinks, mild aperitives, an Emetic about the third day, continued in moderate doses for some time were the principal remedies & were found to operate favourably in many instances; great benefit was derived from Peruvian Bark given alone or rendered laxative by one of the Neutral Salts according to the indications. Some patients vomited in small quantities occasionally, small flakes of a brown & viscous matter, there was some yellowness, but little hemorrhage, & no suppression of the Urine, excepting that which depended on the atony of the Bladder & which was soon relieved on the introduction of a Sound; there were observed in their place considerable Comatose affections, hiccough, subsulting tendinum and a disposition to sweat at the end of

each paroxism, an evacuation which was favourable & critical when it was general, hot, profuse & resulting from the reaction; but injurious, fatal & foreboding the death of the Patient when it was cold, partial, viscous and resulting from the weakness of the nervous & vascular systems. —

Philad.a 1st March 1825

Jno. Abrams